Figures for the Dewey Burdock UIC Permits and Aquifer Exemption Update

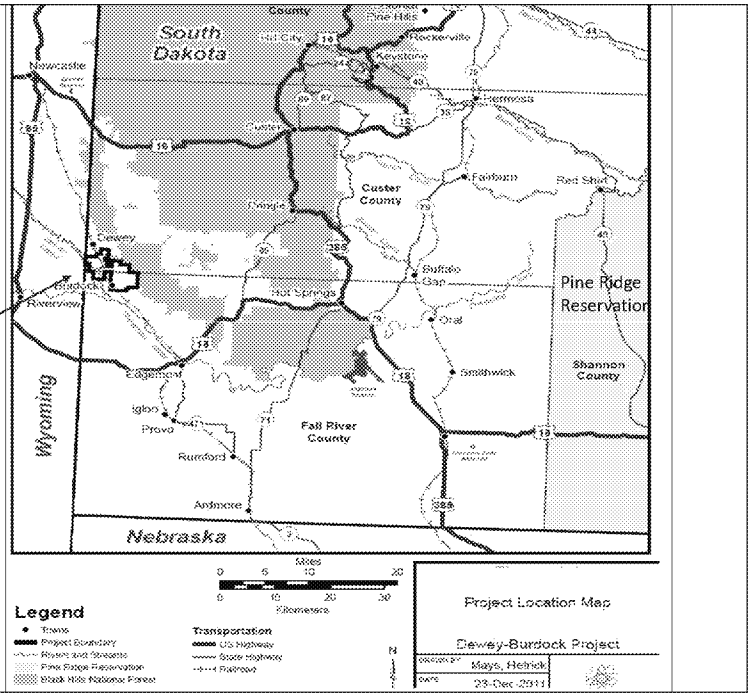


Figure 1

Dewey Burdock Project Site Location Map
Pine Ridge Reservation shown in tan.
National Forest Land shown in green.

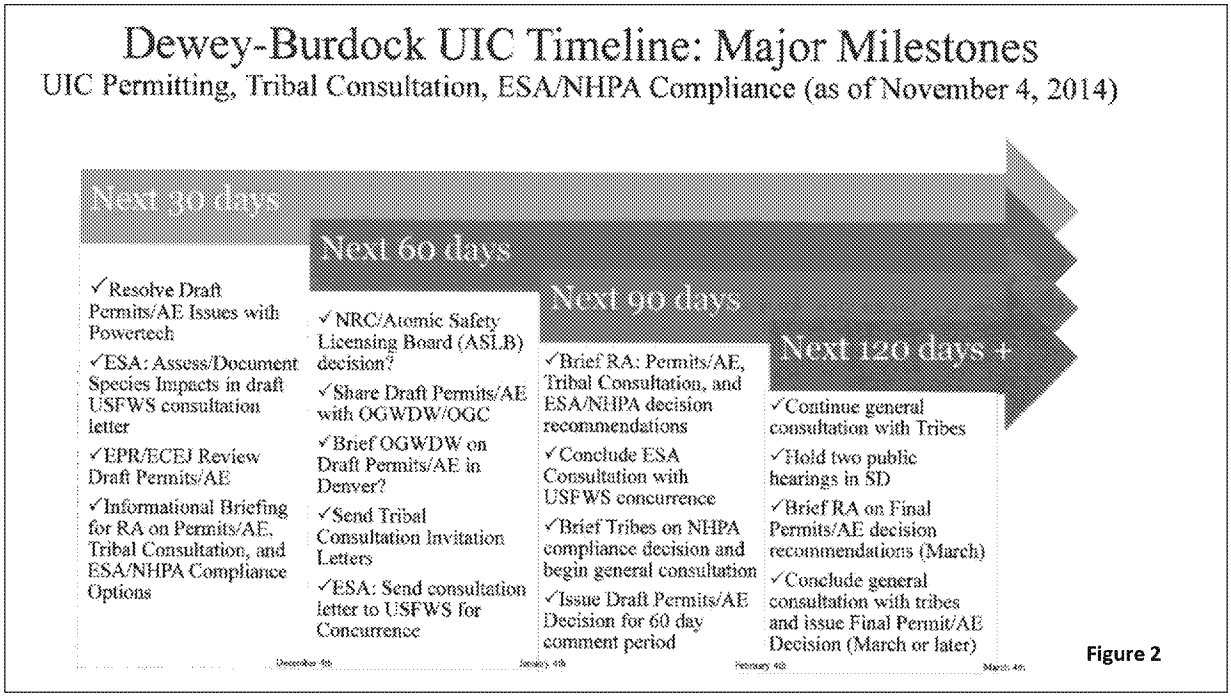


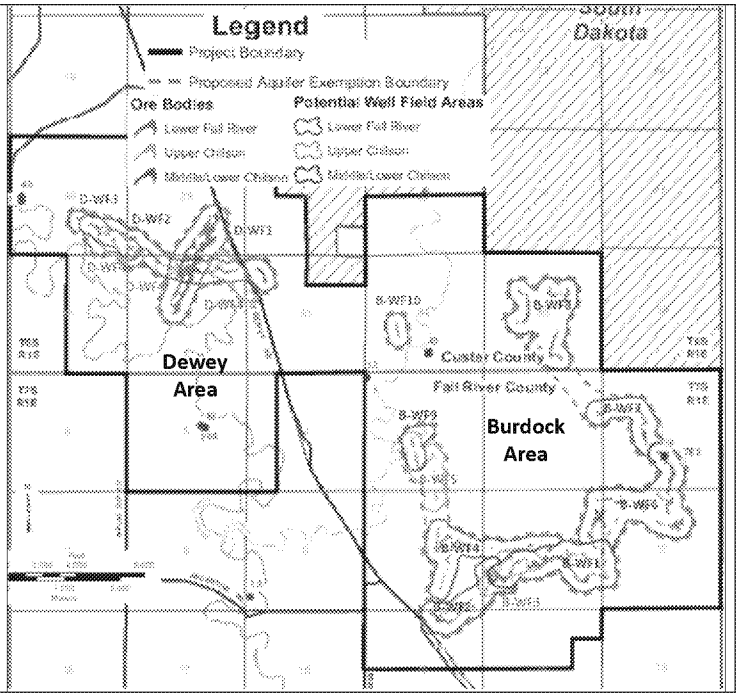
Figure 2

Timeline for activities related to the UIC Permits

Proposed Aquifer Exemption Area

- Three separate areas proposed for exemption
- 4 wellfields in the Dewey Area
- 10 wellfields in the Burdock Area
- The wellfields will contain 100s of injection and production wells
- Because injection and production wells change roles throughout their life, both types of wells are being regulated as injection wells.
- The vertical extent includes the Inyan Kara Group aquifer (see cross section in Figure 4)

Figure 3



Wellfields color-coded according to the stratigraphic unit hosting the ore zone (see slide 4). The aquifer exemption boundary is the dashed green line. This figure also shows the Dewey Area and Burdock Area of the Project Site.

AE Vertical Extent

Ore deposits occur within all the sandstone units shown:

- the Fall River Formation (blue in Figure 3),
- Upper Chilson (green in Figure 3)
- Middle And Lower Chilson (red in Figure 3)

Graneros Group and Morrison Formation are the major confining zones for the Inyan Kara Aquifer. The Fuson Shale is the confining zone separating the Fall River and Chilson.

These are local discontinuous shale units that will serve as confining zones for individual wellfields.

Injection wells will not be screened across the entire Inyan Kara Aquifer, but only across the ore deposit.

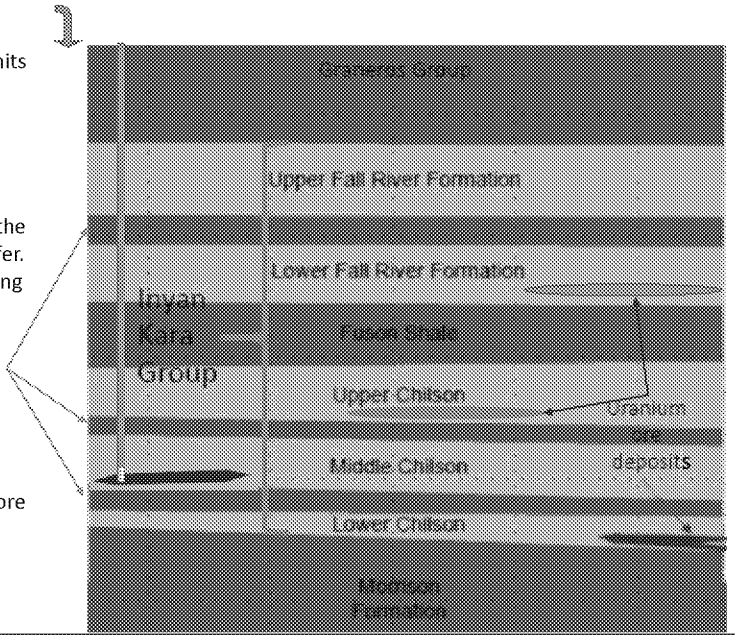


Figure 4

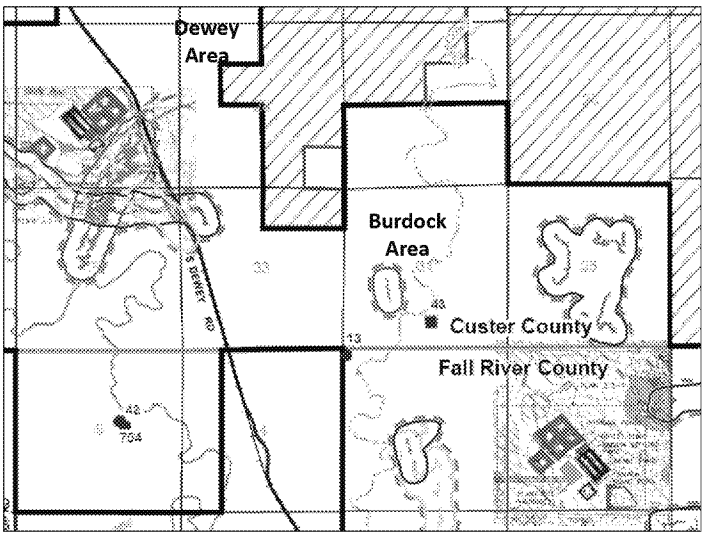


Figure 5

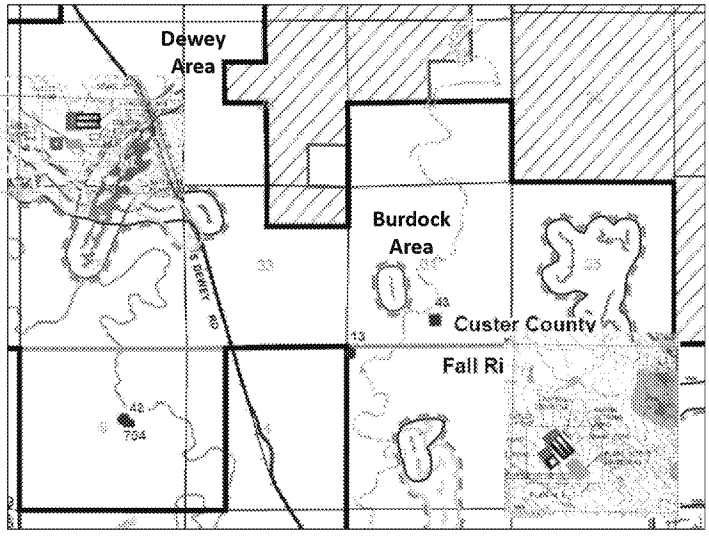
Cumulative effects analysis required for issuance of area permits includes evaluation of ponds storing treated waste fluid from Class III wells.

This pond design is for the land application of treated waste fluids under the SD DENR Groundwater Discharge Permit.

Land application will be used only if the Class V deep disposal wells cannot be used or their disposal capacity is not great enough to accommodate the volume of ISR waste fluids.

These ponds are subject to Clean Air Act Subpart W requirements.

The 6 ponds outlined in pink do not meet Subpart W requirements.



This pond design is for the Class V deep well disposal option for ISR process fluids wastes.

The 4 ponds outlined in pink store the treated waste fluids from the Class III wells which is also the Class V Injectate.

These ponds do not meet Subpart W requirements.

Figure 6

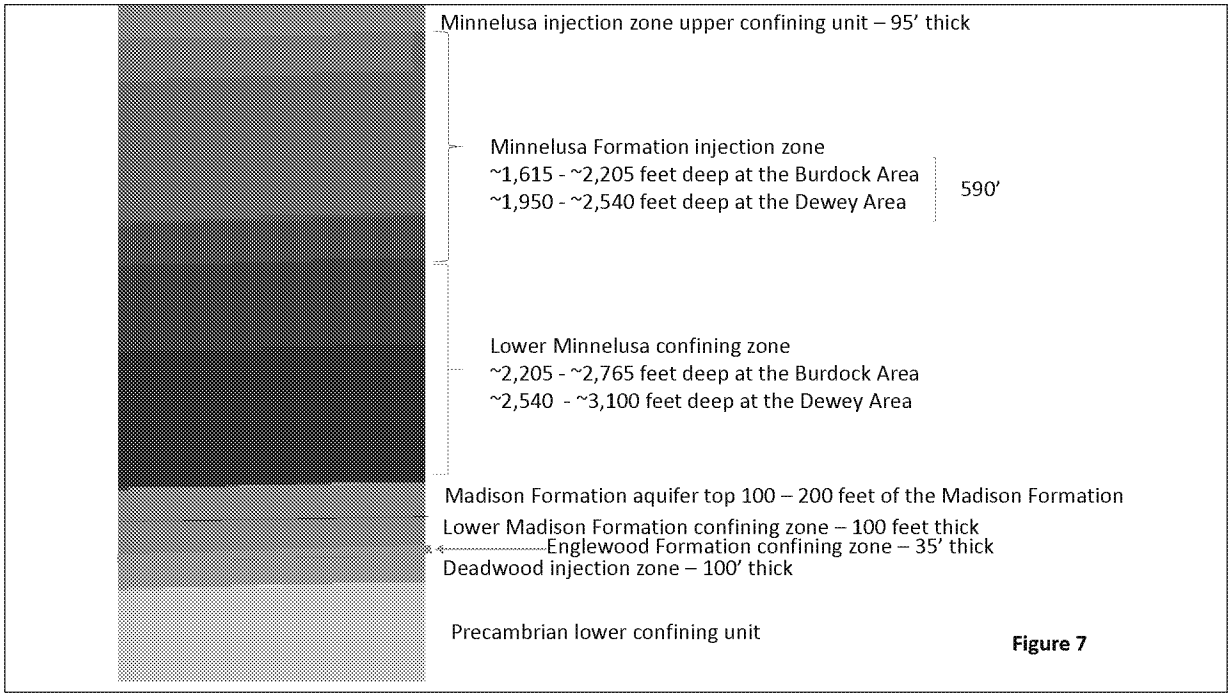


Figure 7

Class V injection zones and confining zones
Although the immediately overlying confining zone for the Minnelusa is about 95' thick, it is overlain by an additional 600' of aquitards with very low permeability.